

REMARKS

Applicants appreciate the Examiner's thorough examination of the subject application and request reexamination and reconsideration of the subject application in view of the preceding amendments and following remarks. Applicants have carefully reviewed and considered the Final Office Action mailed on November 15, 2007, and the references cited therewith. Reconsideration and allowance of the subject application, as amended, are respectfully requested.

Claims 1-31 are pending in this application. As of this amendment, claims 1, 8, 17, and 24 have been amended. As a result, claims 1-31 are still pending in this application.

35 USC §103 Rejection of the Claims

Claims 1, 2, 5-18 and 21-31 were rejected under 35 USC § 103(a) as being unpatentable over Yu (U.S. 5,764,903) in view of Skazinski et al. (U.S. 6,574,709 B1). Applicants respectfully traverse this rejection.

In an effort to advance prosecution, Applicants have amended independent claims 1, 8, 17, and 24 to generally recite that the integrated circuit further comprises a counter configured to clear said at least one bit if said data block is successfully written to said at least one storage array. Applicants' newly amended independent claims are provided below for the Examiner's convenience.

1. (Currently Amended) An apparatus, comprising:

an integrated circuit (IC) configured to receive an input/output (I/O) request to write data stored on at least one target device comprised in at least one local storage array and generate one or more I/O transactions configured to write data on at least one target device comprised in at least one remote storage array, said IC further comprising a counter configured to include at least one bit corresponding to at least one data block transmitted during said one or more I/O transactions which if said at least one data block was not successfully written to said at least one remote storage array, the counter further configured to clear said at least one bit if said data block is successfully written to said at least one storage array.

8. (Currently Amended) A method, comprising:

receiving an input/output (I/O) request to write data stored on at least one target device comprised in at least one local storage array;
generating one or more I/O transactions configured to write data on at least one target device comprised in at least one remote storage array; and

incrementing at least one bit corresponding to at least one data block transmitted during said one or more I/O transactions which if said at least one data block was not successfully written to said at least one remote storage array; and
clearing said at least one bit of said counter if said data block is successfully written to said at least one storage array.

17. (Currently Amended) A system, comprising:

a circuit card comprising an integrated circuit (IC) configured to communicate in accordance with a plurality of different communication protocols, the circuit card configured to be coupled to a bus, and said IC further configured to receive an input/output (I/O) request to write data stored on at least one target device comprised in at least one local storage array, said IC further configured to generate one or more I/O transactions configured to write data on at least one target device comprised in at least one remote storage array wherein said IC further comprises a counter configured to include at least one bit corresponding to at least one data block transmitted during said one or more I/O transactions which if said at least one data block was not successfully written to said at least one remote storage array, the counter further configured to clear said at least one bit if said data block is successfully written to said at least one storage array.

24. (Currently Amended) An article comprising:

a storage medium having stored thereon instructions that when executed by a machine result in the following operations:

receiving an input/output (I/O) request to write data stored on at least one target device comprised in at least one local storage array;

generating one or more I/O transactions configured to write data on at least one target device comprised in at least one remote storage array; and

incrementing at least one bit corresponding to at least one data block transmitted during said one or more I/O transactions which if said at least one data block was not successfully written to said at least one remote storage array; and

clearing said at least one bit of said counter if said data block is successfully written to said at least one storage array.

(Emphasis Added).

In his rejection, the Examiner admits that Lu does not teach or suggest “a counter configured to include at least one bit corresponding to the at least one data block which was not successfully written.” *Official Action*, pages 2-3. The Examiner seems to suggest that Skazinski teaches the counter of Applicants’ independent claim 1. Applicants respectfully disagree with this characterization of Skazinski.

Specifically, the Examiner relies upon column 15, lines 40-46 and column 20, lines 5-19 for this proposition. These passages have been provided below for the Examiner’s convenience.

In the event the mirror operation completes with an error, the I/O process may retry the mirror operation. In the event of a retry, there is a maximum number of retries, after which the partner controller will be killed. The maximum number of retries can be any number. In

one embodiment of the present invention the maximum number of retries is set to 8. *Skazinski*, col. 15, lines 40-46.

In yet another example, if a write a request from a host computer is received that indicates that three blocks of data are to be written to a disk drive array, and these blocks are to be mirrored by a controller to different controller, the bits in bitmap 5 that are mapped to the first five blocks are set to equal "1," for example: bitmap1[0] is set to equal 1; bitmap1[1] is set to equal 1; and, bitmap1[2] is set to equal 1. In this manner, blocks of data are represented by a mirror map.

The present invention maintains two mirror maps per cache line, because if a subsequent mirror operation fails, or, for any reason is incomplete, the identity of data blocks mirrored during a previous mirroring operation for cache line[J] remain intact. This procedure, thereby provides a higher level of data availability to data storage systems as compared to the state of the art. *Skazinski*, col. 20, lines 5-19.

Regarding these passages the Examiner states, "Skazinski et al teach data mirroring includes tracking data and retries at least one data block transmitted which was not successfully written [col. 15, lines 40-46]; specifically, Skazinski et al teach a counter configured to include at least one bit corresponding to the at least one data block which was not successfully written [col. 20, lines 5-19] used for retrying data." *Official Action*, page 3.

It is Applicants' understanding that Skazinski teaches the use of a mirror map to complete a mirroring operation. Applicants respectfully submit that this is not what Applicants have claimed. Applicants respectfully submit that the "mirror map" described in Skazinski is not the same as the counter of Applicants' newly amended independent claims. Further, after a careful review of the passages cited by the Examiner, Applicants are unable to find any reference in these passages to a counter. More specifically, Applicants are unable to find any reference to "a counter configured to include at least one bit corresponding to at least one data block transmitted during said one or more I/O transactions if said at least one data block was not successfully written to said at least one remote storage array." Moreover, Applicants are unable to find any teaching or suggestion in Skazinski to a counter configured "to clear said at least one bit if said data block is successfully written to said at least one storage array."

Since neither Yu nor Skazinski, either alone or in combination, teach or suggest each and every limitation of Applicants' newly amended independent claims, Applicants respectfully submit that these claims are in condition for allowance.

Claims 3, 4, 19 and 20 were rejected under 35 USC § 103(a) as being unpatentable over Yu (U.S. 5,764,903) and Skazinski et al. (U.S. 6,574,709 B1), and further in view of well known in the art. Applicants respectfully submit that this rejection is now moot in light of the preceding amendments.

Since claims 2-7, 9-16, 18-23 and, 25-31 depend either directly or indirectly from Applicants' newly amended independent claims, Applicants respectfully submit that these claims are in condition for allowance as well.

Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney (603-668-6560) to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 50-4238.

Respectfully submitted,

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